MIT's Oldest and
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thetech.com

The Tech
Established 1881

Volume 138, Number 21
Thursday, September 27, 2018

WEATHER, p. 2
THU: 70°F | 58°F
Partly Cloudy
FRI: 61°F | 54°F
Scattered Showers
SAT: 74°F | 49°F
Sunny

ALEXANDER JEROME SANDBERG—THE TECH

An inflatable octopus rests outside the student center as part of an art installation called *Bugs for Jonathan Goldman* Sept. 23. Jonathan Goldman was a fellow and a graduate student at the MIT Center for Advanced Visual Studies in the 1980s.

Student protests, alleging that MIT allowed rapist to return

Stata chalkboard drawing said, 'MIT readmits rapists'

By Jessica Shi
NEWS EDITOR

Several pieces of chalkboard art in the Stata Center over the past few weeks have claimed that MIT allowed a rapist to return to campus.

The student behind these protests, Kollin Wasserlein '19, said in an interview with *The Tech* that someone he knew at MIT was sexually assaulted. The perpetrator left following a Title IX investigation, and now, two years after the case was closed, the perpetrator has returned to campus, Wasserlein alleges.

According to Wasserlein, the victim is no longer at MIT.

The messages chalked by Wasserlein included the phrases, "MIT readmits rapists" (Sept. 12), "the COD [Committee on Discipline] and Chancellor are complicit in allowing rapists to remain on campus" (Sept. 14), and "the Chancellor and COD are rapist enablers" (Sept. 17).

Wasserlein does not know what the official sanction for the perpetrator was, as he has not asked the victim about the verdict.

Instead, Wasserlein is basing his claims on the fact that the perpetrator was removed from the student directories during Wasserlein's freshman year, but the perpetrator's information (with the same email address, course number, and class year) has reappeared recently, leading to Wasserlein's conclusion that he has been allowed to return.

Wasserlein speculates that one of two things could have happened: the perpetrator was suspended for a period of about two years, or the perpetrator was initially expelled but successfully appealed the decision.

Despite his use of "readmit," Wasserlein does not consider it a possibility that the perpetrator was expelled and then applied for readmission through the normal admissions process.

Wasserlein explained what he

Protest, Page 2

MIT Yes on 3 urges students to protect transgender rights

Massachusetts to hold referendum Nov. 6

By Zoe Anderson
ASSOCIATE NEWS EDITOR

Massachusetts will hold a referendum Nov. 6 on a law that protects transgender individuals' rights to access sex-specific public facilities consistent with their gender. In response, a group of students formed MIT Yes on 3 to inform other students about the referendum and help them register to vote.

MIT Yes on 3 works with Freedom for All Massachusetts (FFAM), a group pushing for the protective law not to be repealed. FFAM coined the term "Yes on 3": a "yes" vote on question 3 on the ballot will be a vote to keep the law in place.

The current law prohibits discrimination on the basis of gender identity in places of "public accommodation, resort, and amusement," along with race, sex, religion, and other grounds. It requires such places with separate facilities for males and females (such as bathrooms and locker rooms) to allow anyone to use the facility consistent with their gender identity, which may differ from their sex assigned at birth.

Massachusetts Governor Charlie Baker (R) signed the bill into law July 7, 2016, making Massachusetts the eighteenth state to have a law in place protecting against discrimination on the basis of gender identity.

It is expected to be a close vote. In a Boston Globe poll published last Wednesday, 51.8 percent of respondents said they would vote yes, 33 percent no, 15 percent were undecided, and 0.2 percent refused to answer.

MIT Yes on 3 is holding info sessions and study breaks in dorms in order to make students aware of the referendum, get them registered to vote, and get more volunteers.

"What [Yes on 3] really needs is for college students to bump [the close vote] over, because a lot of college students do agree with the message but might not be registered to vote or remember to vote," Zoe Levitt '21, team lead of MIT Yes on 3 and a Cambridge resident, told *The Tech* in an interview.

All the students MIT Yes on 3 has talked to so far have been supportive, Levitt said.

"Some people might not be as motivated to vote in Massachusetts because they think 'it's a pretty democratic state, there's nothing that my vote will really do.' We're trying to make sure that they know it's a really important question," Levitt said.

Levitt also thinks that not many students are aware that protecting transgender rights will be on the ballot this November, due to lack of publicity and students not paying enough attention to elections. "Most people were gone for the summer, and they just got back, and you're not going to hear about this question in other states unless there's some big deal about it not passing or passing [there]," Levitt said.

"MIT is steadfast in our support for transgender students, and the outcome of Question 3 will not change our nondiscrimination policies, which prohibit discrimination based on gender identity, among other things. For those who care about Question 3 — and any other issue — it's vital to register to vote and then to vote," Abigail Francis, assistant dean of LGBTQ+ Services, wrote in an email statement to *The Tech*.

MIT is a member of the coalition of colleges supporting Yes on 3, according to FFAM's website.

The Cambridge City Council endorsed Yes on 3 Sept. 24.

MIT pilots four all-gender bathrooms

Bathrooms include modifications to increase privacy and new signs

By Jocasta Manasseh-Lewis
STAFF REPORTER

MIT has launched a pilot project designating four multi-stalled, nonresidential bathrooms as all-gender.

These restrooms are spread out around campus — one in 4-201, another in 5-316, and two in the Media Lab. Updated signs outside the restrooms state that they are all-gender. Signs inside the bathrooms include a QR code that links to a survey to provide feedback on the pilot.

The pilot was funded by the Department of Facilities. According to an email that Diversity and Inclusion Office Judy Jackson wrote to *The Tech*, the costs for the pilot included paying for modifications to enhance the privacy in the restroom stalls and installing the new signs.

The project was organized by a team of students, faculty, and staff, with support from LBGTQ@MIT, the Office of Campus Planning, the

Bathrooms, Page 3

MAHI SHAFIULLAH—THE TECH

Students gather around Rev.com's booth at MIT's Fall Career Fair Sept. 21. The fair, held in the Zesiger Center and adjacent facilities, attracts hundreds of companies every year.

IN SHORT

There will be a **blood drive** next week from 1–6 p.m. Monday, Wednesday, Thursday, and Friday and from 8 a.m.–1 p.m. Tuesday in La Sala de Puerto Rico in the student center.

The deadline to **add a full-term subject** is Oct. 5. This is also the deadline to designate subjects as sophomore exploratory or junior-senior P/D/F.

There will be a **flu shot clinic** Oct. 3 from 9 a.m.–3 p.m. in Walker Memorial.

Interested in **joining** The Tech? Stop by for dinner Sunday at 6 p.m. or email *join@tech.mit.edu.*

Send news and tips to *news@tech.mit.edu.*

HOW WAS YOUR (HOT) SUMMER?

Climate change is here to stay, unless we do something about it. **OPINION, p. 4**

SOLVING SOLAR CELLS

The PVLab at MIT hopes to optimize clean energy. **SCIENCE, p. 10**

A SURREAL FILM

Madeline's Madeline leaves the viewer confused. **ARTS, p. 6**

INCUBE INNOVATION

Students confined to glass cube for entrepreneurship competition. **PHOTO, p. 9**

RUSSIAN DOG GAME

Jumping and barking as a Russian subway dog is addicting. **ARTS, p. 6**

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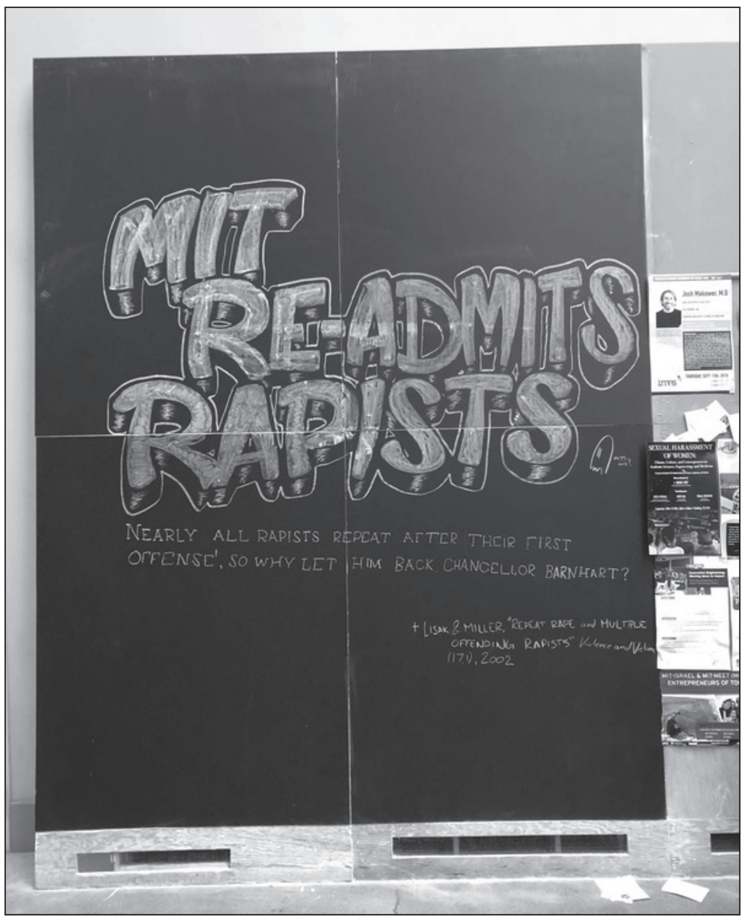
Chancellor 's Office declines to comment on details

Wasserlein says his chalk art is a way to get students to 'care about effective punishments'


MIT
RE-ADMITS
RAPISTS
NEARLY ALL RAPISTS REPEAT AFTER THEIR FIRST OFFENSE†, SO WHY LET HIM BACK CHANCELLOR BARNHART?
† LISAK & MILLER, "REPEAT RAPE and MULTIPLE OFFENDING RAPISTS" Violence and Victims (17.1), 2002
SEXUAL HARASSMENT OF WOMEN
MIT-ISRAEL & MIT-MEET
ENTREPRENEURS OF TO

YIDA WANG

A drawing on the chalkboards in the Stata Center Sept. 12 read "MIT re-admits rapists. Nearly all rapists repeat after their first offense, so why let him back, Chancellor Barnhart?"

Protest, from Page 1

hopes is the outcome of his protests. "I see myself in this situation less as someone who has a great deal of ability to affect change but more as somebody who is able to shine a light on something that people don't know about," he said.

"I want to elicit the outrage that [the situation] deserves. And I feel that if administration sees that students care about effective punishments for people that commit crimes like this, then in the future, cases like this would be considered differently," Wasserlein continued.

The driving force behind these protests appears to be solely Wasserlein, though he says others have reached out in support.

Wasserlein and the victim are not in contact anymore, so the victim has not been consulted about the protests, Wasserlein explained in a follow-up email to *The Tech*.

"I am sure that these events, both the man being back on campus, and my actions, would not be helpful in allowing her to put his assault behind her," Wasserlein wrote. "I did not make the decision to speak out about the rapist's readmission without thinking about that, but in my own estimation, if the [I]nstitute is not punishing rapists in accordance with their actions, and they are allowing dangerous people back on campus, then people deserve to know."

Wasserlein and the perpetrator have a mutual No Contact Order, which Wasserlein requested because "I want to be as far away from a rapist as possible," he said in the interview.

Wasserlein was unable to share further details about the case, in order to protect the privacy of the victim and also to avoid saying anything that could be construed as "threatening or intimidating" to the perpetrator, so *The Tech* was not able to independently verify his claims.

"We are aware of the statements that have been drawn on the Stata chalkboards," according to a statement by the Office of the Chancellor emailed to *The Tech* Tuesday. "In order to protect the integrity of the disciplinary process and respect the privacy of all of the individuals involved, however, we will not be commenting on specific disciplinary matters."

"MIT takes student sexual misconduct and assault very seriously and has an established response, adjudication, and sanctioning process to respond to reports of this nature," the statement said.

The statement did not directly address *The Tech*'s questions about what MIT has done or plans to do in response to the protests, what factors would motivate a decision to suspend a student versus expel them, or what factors are considered in the appeal process. Instead, it linked to the Title IX, Committee on Discipline (COD), and Chancellor websites.

According to the COD's guidelines, either the complainant or respondent may appeal a decision reached at a sexual misconduct hearing or sanctioning panel (if the case meets specified grounds), "regardless of the finding of responsibility or the severity of the sanction."

Appeals are then decided by the Chancellor in consultation with the Chair of the COD and the members of the COD who decided the case; her decision is final.

Chancellor Cynthia Barnhart PhD '88 extended an invitation to Wasserlein to meet and "discuss ways to advance MIT's sexual misconduct prevention and response effort," according to an additional statement by the Office of the Chancellor emailed to *The Tech* Wednesday. According to Wasserlein, they are now in the process of scheduling a time.

Wasserlein is currently taking a break in continuing the Stata messages, because "the news of this man's returning to campus has caused me a great deal of stress, and so I'm trying to make sure I have my feet under me academically as I continue protesting this decision," he wrote. "I plan to resume my messages very soon."

Want to draw graphics that engage, provoke, and speak to the MIT community?

***The Tech* is looking for editorial cartoonists.**

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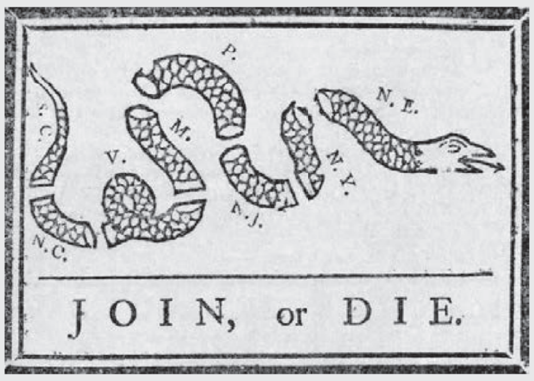
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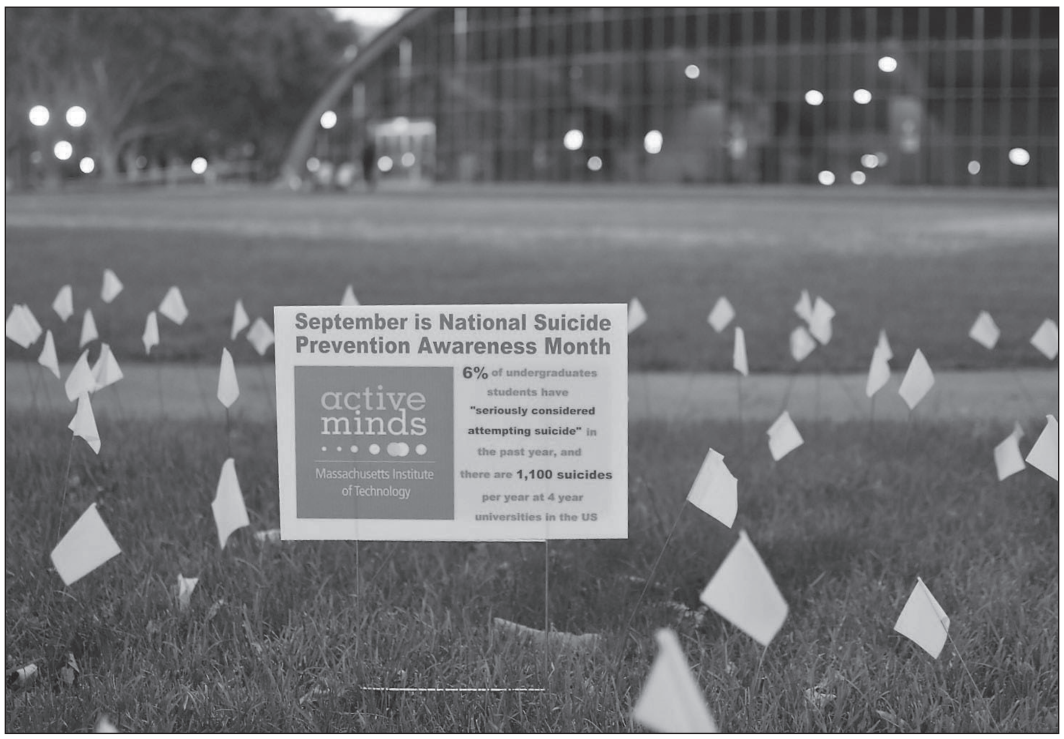
September is National Suicide Prevention Awareness Month
active minds
Massachusetts Institute of Technology
6% of undergraduates students have "seriously considered attempting suicide" in the past year, and there are 1,100 suicides per year at 4 year universities in the US

ALEXANDER JEROME SANDBERG – THE TECH

Yellow flags, intended to bring attention to National Suicide Prevention Awareness month, surround a sign that presents statistics about suicide outside the Stratton Student Center.

Got a lot on your mind?

Share some thoughts with us!

Write for Campus Life. *join@tech.mit.edu*

Or join us for dinner, Sundays 6 p.m. (W20-483)

Student recomms. informed pilot

Future plans include making pilot restrooms permanent

Bathrooms, from Page 1

Department of Facilities, and the Provost's Office.

The pilot stemmed from recommendations by student groups such as LBGTQ@MIT, according to Jackson.

During the 2015-16 academic year, LBGTQ@MIT published a list of recommendations for the Institute, including a request for gender-inclusive restrooms. At the time, the group noted that MIT did not "have a strategy to ensure that renovation, reconstruction, and new construction includes Gender Inclusive Restroom spaces across the Institute."

As the team started to implement the recommendation, MIT Campus Planning and Campus Construction found that Massachusetts state plumbing codes restrict the designation of multi-stall restrooms as either male or female.

MIT was granted a variance by the Massachusetts State Board of of Examiners of Plumbers and Gas Fitters.The team is required to report back to the state board in a year.

Jackson wrote, "We plan to seek state approval to make the all-gender designation of the four pilot restrooms permanent, and we hope to identify a moderate number of additional restrooms in various locations around campus that may also be modified for inclusive use."

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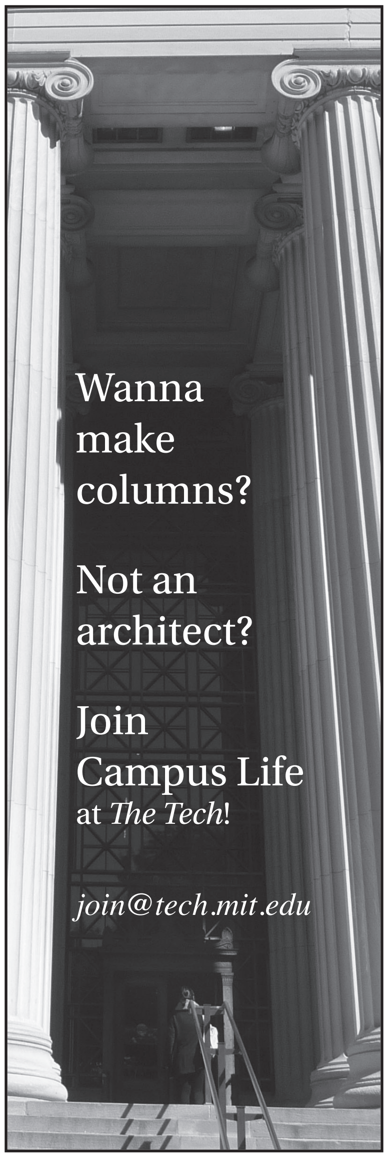

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How was your (hot) summer?

The necessity for climate action begs for a mother lode of invention

By John Fernández

“How was your summer?” asked your friend or roommate, lab mate, coach, advisor, fraternity brother or sorority sister. As Head of Baker House, I also wanted to know about summers at Google and Goldman, in California and China, traveling, relaxing at home.

I’ve been on the faculty 19 years and this year I heard something different. Besides, “fine, busy, chill…” I’ve also heard “wow, it was hot!”, “super-hot,” and “tired of fires and floods.”

Until recently, climate change was about the future: 2050, 2100, and beyond. It was speculative, somewhere else. You may have noticed; the future has changed. Back home, where your family lives, where you grew up, where you interned, where you traveled for vacation or work or research, the answer to “How was your summer?” has changed permanently.

If you were in California, temperatures around the state topped 110 degrees Farenheit (43 ºC); San Diego 117 F (47.2 ºC), UCLA 111 F (43.8 ºC). In the north, you had some things to contend with: 105 F (40.6 ºC) in San Francisco and the largest fire in state history, the Medocino Complex Fire, which started in late July and consumed 495,000 acres and was only just contained last week.

If you were in the western U.S., Denver tied a record high of 105 ºF. If you hail from the mid-Atlantic and southeast coast of the U.S., from Long Island down to the southern tip of Florida, you had sunny day flooding; also known as nuisance flooding that is getting worse, faster than predicted, driven by sea level rises of about one inch per year.

Or if you were hanging out on the beautiful beaches of southwest Florida, you had that awful and enormous red tide to deal with. Prompted by several factors, chief among them the concentration of nutrients from industrial scale agriculture, these kinds of algal blooms — and the massive die-off of fish and other sea life — will become much more difficult to prevent and control with rising sea temperatures.

Of course, what we notice over one particular summer is only a small part of the climate changes that are now all around us. Are you from the Midwest? Between the 100th and 98th meridian lines (the Dakotas, Nebraska, Kansas, Oklahoma, Texas)? If so, you might know that the arid west is moving east. That is, the arid grazing plains of the west are overtaking the cornfields of the east and bringing serious worry to family farms and livelihoods.

The summer was a disaster to some regions completely unprepared for heat waves. In Quebec, where only 53 percent of households have air conditioning, 54 deaths were attributed to temperatures in the 90s ºF (low- to mid-30s ºC) with Montreal hitting 97.9 ºF (36.6 ºC). Forty percent of the deaths due to this heatwave in Montreal were women 60 years and older.

If you had the good fortune to be abroad, well, your summer in Scandinavia was hot and plagued by fires too. England posted one of the driest summers on record with London suffering through a heat wave. Many — too many to list here — monthly record temperatures were set in Amsterdam, above the Arctic circle, two dozen Chinese cities and provinces, and many more. Norway and Japan set new national high temperature records, and in the middle east, Quriyat, Oman recorded the planet’s hottest daily low temperature ever: 109 ºF (42.6 ºC).

So, by now you get my message. Our climate has changed, and now we have no choice but to contend with it. You likely already have this past summer. It’s as simple as that. No choice. It’s here, and it’s real.

And it will continue. It doesn’t take a hurricane to cause massive coastal flooding; if forecasts hold, as many as 20 North Carolina coastal communities may be submerged during the next 15 years. By 2100, the U.S. eastern seaboard may be under siege with 500–700 coastal communities inundated. By the way, many past forecasts underestimated the current rate of sea level rise to date.

I’ve written this piece for *The Tech* because I am addressing you — undergrads and graduate students, younger members of staff and faculty. You will live well into the second half of this century, and some of you may actually see the year 2100 given some of the more optimistic predictions on increasing longevity. You have lived your entire lives in a changed climate, and you will know whether there will be a complete loss of Arctic ice, massive calving of Antarctic ice shelves, disastrous sea level rise and coastal retreat, increasingly powerful storms, and more.

You will live to see what we do about it. You may be understandably cynical about the prospects for real action, but remember, we’ve logged some recent massive successes on other fronts. We pulled 1 billion people out of extreme poverty. We’ve gone a long way toward healing the ozone hole. We essentially shut down acid rain, and more. We can solve climate change.

You can start today. Go beyond meat — be smart about your electricity use; defend science; support a price on carbon — but don’t stop there. As an MIT student, ask yourself: how can your declared major invent solutions to climate change? AI for natural landscapes and agriculture that maximize carbon capture and biodiversity; engineering and design of net-zero carbon cities and aircraft; green chemistry for lower temperature industrial processes; genetic engineering for the next food revolution; dematerialized business models for an economy that fully values our natural capital. Imagine starting a viral campaign on social media that reduces global plastic pollution. Start a company to support the circular economy — make billions while securing the planet for billions. Ask your 8.02 professor — how can I learn what I need to make a difference?

Sound idealistic? You can believe so, but only until it all becomes critical. Then it’s just necessary. Do you think it’s necessary yet?

To know more, visit https://environmentalsolutions.mit.edu/ and the newly launched MIT Climate Portal at https://climate.mit.edu which will lead you to the many groups working toward a humane and sustainable future; MIT Energy Initiative, Sloan Sustainability Initiative, J-WAFS, Joint Program on the Science and Policy of Global Change, the Lorenz Center and others.

John Fernández ’85 is a professor in the MIT Department of Architecture and director of the Urban Metabolism Group.

CORRECTIONS

Due to a production error, an earlier draft of the article “Districts and Data” was published last week. The name of the software used by the Metric Geometry and Gerrymandering Group is GIS, not GNS. An updated version of the article is available online.

OPINION POLICY

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Fighting for safer biking and better transit in Cambridge

A new plan aims to increase biking safety and reduce traffic on Mass Ave

By Dustin Weigl and Michael Davidson

This fall, welcome changes will be coming to MIT as the City of Cambridge plans improvements to the South Massachusetts Ave corridor from Sidney Street to Memorial Drive. In its current state, while navigating this section of Mass Ave, one needs to contend with narrow or non-existent bike lanes, double-parked cars, and distracted drivers speeding inches from your handlebars. The view from the bus is not much better. The 1 and CT1 buses, the most highly trafficked routes in Cambridge, are usually stuck behind a seemingly interminable row of cars during rush hour, reliably taking way too long to make what should be a short trip to Boston or Harvard Square. This project will be a huge improvement to one of the main thoroughfares on campus and will be a proving ground for similar steps to improve transportation around Cambridge.

The planned changes include protected bike lanes that will separate bikes from fast-moving traffic using vertical “flex posts” as seen on parts of Brattle Street, in Central Square, and other parts of Cambridge. The second prominent feature is a bus-only lane that will replace one of the two current vehicular lanes in some sections. This will allow buses to bypass traffic and more efficiently move a greater number of people through the corridor. Additionally, a new crosswalk with flashing signals in front of Flour will improve walkability and pedestrian safety. The city is holding an open house to discuss these designs with anyone who is interested this Thursday, Sept. 27 at 6 p.m. in 32–155.

This corridor is one of the most dangerous in the city for people biking — in fact, an MIT student was killed at the intersection of Vassar Street and Mass Ave in 2011. Crash heat maps show high incidence rates even after accounting for the large volume of bikers. Pedestrians face similar dangers given the long crossing distance and impatient speeding and swerving of drivers and cyclists. Just beyond the project boundary in Central Square, a man earlier this year was hit by a car and killed walking in a crosswalk at night, and another cyclist was recently struck by a opening car door in a hit and run crash.

For buses, the Mass Ave section around MIT has also been identified as one of the worst in the entire MBTA service territory, receiving a “failing” grade based on reliability and excess time sitting in traffic. Encouraging people to get out of their single occupancy vehicles and onto more sustainable transportation has been a city priority for over two decades, but late, infrequent, and slow bus service is a major barrier to attracting more riders. Those who cannot afford to own a car or take taxis are stuck with few alternatives. The bus priority lanes address this issue and make the sustainable and efficient option more attractive.

South Mass Ave is a short half-mile stretch in a much larger 20-mile citywide protected network that Cambridge designed as part of the 2015 Bike Plan. Connectivity is perhaps the most important feature of a bike network for occasional or aspiring bikers wary of dangerous conditions. As soon as protected lanes end, bikes are thrust uncomfortably into or next to traffic. Experiences in other cities from New York to Seville demonstrate that benefits in terms of usage are really only achieved when people can travel safely the entire length.

Unfortunately, the city’s efforts to build the network have slowed in recent years. The half-mile section addressed in this project is the only addition the city has planned for 2018. This delay is the result of efforts by a small group of angry abutters who show up to city meetings on individual streets that are key pieces of the network and fight the development of protected bike lanes. But the slow development is also due to the lack of a clear implementation plan and process for the city to include the bike plan in its projects.

A local petition effort, spearheaded by volunteers at Cambridge Bicycle Safety, is underway to ask the city for a five-year commitment to build the network, to complete a preliminary design street-by-street for the entire network by next year, and to incorporate the bike plan in all street reconstructions. This timeline is more than possible, based on experiences in other cities, but is nonetheless more than many city officials appear to be willing to do at present.

This project will go a long way towards making this section of Mass Ave safer and more efficient for MIT and the greater Cambridge community. It will also hopefully be the first step of many in building the sustainable and usable transportation network our city needs. If you have an opinion on the future of this project and on transportation in general, please make your voice heard at the public meeting on Sept. 27 (6–8 p.m. in 32–155). Cambridge should set an example for other cities by prioritizing public transportation, walking, and biking, and voices from the MIT community will be important in adding to the growing chorus in support of more action for safe streets.

Michael Davidson is a recent graduate of the Institute for Data, Systems, and Society, and is representing Cambridge Bicycle Safety on the project advisory board.

Dustin Weigl is a masters student representing MIT students on the project advisory board and is chair of the GSC transportation subcommittee.

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MOVIE REVIEW

Madeline's Madeline is part mental illness, part performance, and whole immersion

Would you like some sugar with that cup of anxiety?

By Nyssa Miller

If a good movie draws you into the emotions of the scene, *Madeline's Madeline* is a wannabe-blockbuster...if you're into holding your breath for ninety minutes with a decidedly unfun adrenaline rush at every twist. The movie is as much about the titular character as it is about mental illness. And for somebody who has experienced such illness before, this film can suck you back into those emotions and leave you winded, but perhaps also introspective.

Madeline's Madeline is an independent film that shows the ugly side of life from Madeline's perspective. Madeline (Helena Howard) is a sixteen year old girl with a history of mental illness growing up in New York City and dreaming about attending a performing arts school. But on the surface she's weird and friendless. Her only chance to be herself is at a local theater troupe, where every day she's somebody completely different. And where the only person who understands her is theater director Angeline (Molly Parker), who has a keen eye for talent and opportunity.

Josephine Decker captures Madeline's turbulent life through a sensitive lens. *Madeline's Madeline* is disjointed, dreamy, and poignant; the line between real and fake is so blurred that the audience finds themselves struggling like Madeline to pinpoint what really happened. While at times the style seems too distracting, the real world snaps back to focus like a rubber band, smarting and jarring.

Madeline's Madeline is full of suspense, surprise and surreality. Madeline and her mother (Miranda July) toggle between dysfunction and affection. On her own, Madeline is wildly spontaneous and, for a neurotypical person, may be difficult to follow or relate to. And though the title suggests that Madeline is herself, at the end of the movie you could ask yourself "Who is Madeline really?" and potentially come up empty-handed.

★★★☆☆

Madeline's Madeline

Directed by Josephine Decker

Screenplay by Josephine Decker

Starring Helena Howard, Miranda July, Molly Parker

Unrated

The direction of the film is ambitious and sometimes unwieldy. This is not a movie you can watch absently: you have to be present at every moment in order to understand the sudden plot turns. So if you're looking for something idle or feel-good, look somewhere else.

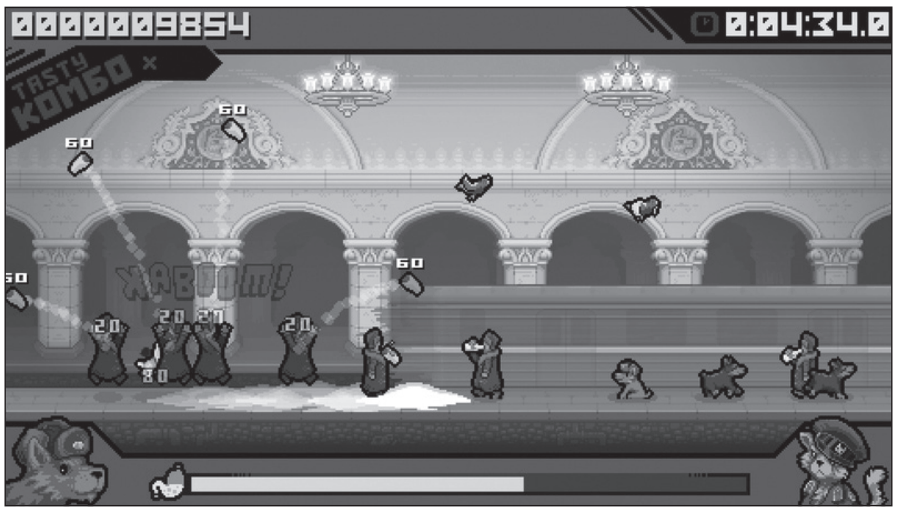
Even though the story mostly moves forward, it's debatable if the characters do. The movie seemingly ends before we see any development with or between the three main women, and when the credits suddenly roll, you might find yourself feeling abruptly shaken out of slumber.

Madeline's Madeline is taxing to comprehend, and the reward is debatable. The stylistic choices are undoubtedly aesthetic, but the story seems to suffer in time with Madeline's illness. But that's just my take on it: this movie is as subjective as a dream, and the pull into dreamland can be just as entertaining.

VIDEO GAME REVIEW

Russian Subway Dogs is a punny canine platformer

In Mother Russia, when you bark at vodka, vodka bark at you



COURTESY OF SPOOKY SQUID

In *Russian Subway Dogs,* you play as a dog hunting for food.

By Alia Rizvi

At initial glance, the beta test of *Russian Subway Dogs* by Spooky Squid Games Inc. is fun-to-play, charming, and quirky in its art style and character but has a high learning curve (for an average gamer like me) from level to level.

The basic mechanics of the game involve you, the player, playing as a Russian subway dog who can walk back and forth across a platform (using the left and right arrow keys), bark at people (using the X key) to cause them to drop items such as shawarma or alcohol, bark at items to make them bounce in the air, and jump to catch food (using the Z key).

Russian Subway Dogs uses game mechanics that combine to create fun combo-actions that increase your points. Barking at a person holding vodka releases a vodka bomb that, when launched towards a person with food, will create flaming food or can interact with other vodkas to create a bomb twice as strong. With different items, you can gain different power-ups or can increase different food combos or enable different powers, and the combination of power ups with food make the game enjoyably iterative. The iterations of these combos fit with the overall humorous style of the game; for example, hot sauce is a power up that allows you to breathe fire.

The game, as described by its creators, is a "systemic-arcade game," highlighted by Miguel Sternberg (one of the two game developers of Spooky Squid Games Inc.) in his tweet about a Medium article. The tweet quoted the author of the article, D.W. Wallach, in their description of when they saw the way the different mechanics of the game worked to their benefit in an especially chaotic level:

"While your only inputs are to jump or bark, these two actions can create some wild scenarios. … an enemy NPC dog caught [the hot sauce] instead — receiving the power up to shoot fireballs. …the rival dog ended up shooting fire at a caribou that was charging me… [which] turned into cooked meat, and my family was well fed that day."

While the game itself is fun to play over and over again, for an average gamer like me, I'd say the increase in difficulty between the first two levels is too large. You have to earn 500 points to pass the first level, but you need 2000 to pass the next.. I found this a little frustrating at first, but having multiple objectives within each level to complete during repeat plays allowed me to gain skills and strategies that would help me beat the next level.

I enjoy that this isn't just a mindless arcade game. After the first level, if you only rely on the scaring people into giving up their food mechanic, you will not be able to beat other levels unless you learn to kill the rival dogs, make flaming food, or figure out other interesting combinations.

The only mechanics of the game I dislike are the ones where you have to re-read dialogue (which is refreshing and cute the first time) every time you select a new level, making you slightly weary of the dog commander instead of ecstatic to see his image pop up on the screen. This doesn't necessarily apply to the dialogue your kittens have when you leave, because it's an easy way to make a game charming by having a short and sweet "farewell" or "welcome" for dialogue.

There is also a mechanic where at the end of the level, if you don't reach the threshold amount of points, you watch the dog slowly die while it says: "Reach F to unlock the subway." You have four seconds of pointless gameplay at the end of each game just dying, jumping up and down in front of the closed train doors, while your controls are in slow-motion.

★★★☆☆

Russian Subway Dogs

Developed by Spooky Squid

Published by Spooky Squid

Rated T for Teen

Available on PC

Mechanics and arcade technology in mind, I think the art style is what makes this game mesmerizing to play and watch. There are quirky icons you can play as, funny (and punny) dialogue, a catchy and dramatic soundtrack when you win or lose, and very intuitive UI that make the game much easier to understand. I like that they use some Russian text in their game alongside English to add to the authenticity of the cultural setting, and it uses a well-rounded color palette (red, black, beiges, and military green).

Overall, the concept of being a Russian subway dog who has to compete with other dogs to bring food home for their family is one that you never knew could be such a cute, addicting game. While I wouldn't pay $15 for it, if you have a group of friends and a couple of weekends where you'd want to finish it all, this would be a good source of casual fun.

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MOVIE REVIEW

Ride isn’t just another sports-type BMX movie

An inspiring, atypical underdog story based upon the life of real-life BMX star John Buultjens

★★★★☆

Ride

Directed by Alex Ranarivelo

Produced by Hadeel Reda

PG-13

Starring Ludacris, Shane Graham, Sasha Alexander, and Blake Sheldon

By Sophia Chan

Surpassing many limitations imposed by the budget of an indie film, this work has undoubtedly proven to be worth the watch.

Unlike many sports movies of a similar kind, *Ride* interweaves a crucial societal element into its plot: the pressing topic of race. It doesn’t merely sprinkle it in. Rather, it utilizes race as a vehicle to convey the importance of seizing second chances and to drive a change for more acceptance. Although not flawless in the cinematic sense, the film is inherently inspiring at its core.

Adapted from the true story of Scottish BMX rider John Buultjens’s life, *Ride* follows the life of a young child (John) from a white supremacist family who finds himself in a juvenile detention center. Through the efforts of a persistently supportive social worker, John finds himself eligible to enter a foster home only to discover that his foster parents are interracial, to his dismay. When John’s foster father buys him his first bike, John becomes captivated by the world of BMX. Through the sport, he finds not only glory but also acceptance and forgiveness.

Although all of the actors and actresses provide a raw and emotional delivery on their performances, there was some disconnect between the believability of the performers and their roles. At times, it almost seemed unnatural for the actors to be playing their characters in a way that sacrificed the emotional connection that the audience would’ve wanted to draw with the storyline.

Additionally, the different aspects of the piece did feel slightly disconnected at certain points. From one scene to the next, it often felt as though the topic at hand was unresolved before moving on. With regard to the race issue, the film takes a rather unrealistically positive regard toward racial tension and hostility. In the initial scenes, the conflict between John’s white supremacist thoughts and tendencies formed a paramount part of the film’s message, but as everything progressed, the focus shifted entirely toward his newfound BMX career without dedicating much explanation toward his thoughts toward race.

However, it is necessary to note that while this film was produced under an immensely tight budget, the graphics and the range of action shots were definitely beyond impressive.

Besides cinematic aspects, the film was, at heart, an undeniably moving and well-intentioned work aimed to facilitate connections person-to-person, regardless of skin color. The rawness of emotion was truly felt through every hug and every tear. Yet, perhaps the most important takeaway from the film was the notion that people are indeed capable of changing for the better and that there’s always sufficient time to turn one’s life around, just as John proved.

While certain aspects of the film were more questionable than others, ultimately, *Ride* is still a high quality piece that provides both entertainment and reflection as well as good-feeling. Please, go watch it. You won’t regret it.

THEATER REVIEW

Two rooms and a sea of troubles

Short, thought-provoking play on the nature of death, child-parent relationships, and enduring impact

Hamnet

Directed by Bush Moukarzel and Ben Kidd

Emerson Paramount Center

Sept. 20–Oct. 7

By Alexandra Sourakov

STAFF WRITER

Hamnet is a raw, intimate portrait of William Shakespeare’s only son who died at the age of 11 and has ever since been shrouded in mist. We don’t know much about him, and it’s likely he didn’t have a chance to interact much with his father. Yet, his existence is like a prism through which people have, for centuries, tried to glean further hints about the Bard’s internal musings. Tune the index of refraction, and we see the child himself, with his own dreams, his own foibles, his own demons — this is who appears on stage in *Hamnet*.

“I want to be Hamlet,” proclaims Hamnet (Ollie West) to the audience. Indeed, in the 16th century, those two names would have been completely interchangeable. Throughout the play, Hamnet demonstrates that he’s been practicing his lines as he runs through familiar scenes from *Hamlet*. With these touching, coltish efforts, West underscores Hamnet’s desperation for his father’s approval, the vulnerability of childhood, and bemusement at the adult world. Amongst these hefty themes, West demonstrates his versatility as an actor by sprinkling in welcome doses of humor.

Shakespeare makes an appearance in an…unusual fashion. The play is a kaleidoscope of visual effects, the primary one being that Hamnet is interacting with a green-screened version of his father. As a result, West is actually on stage alone almost the entire time, but his unwavering delivery makes it easy to forget the fact as West talks, plays ball, and dances alongside his incorporeal father. Although the technology is not new, I have not seen it leveraged to such an extent in a theatrical production. At first, it seemed a bit ungainly and superfluous, but when Shakespeare is explaining to Hamnet what it means “to be” or “not to be” and tells him to imagine two rooms, it clicks into place: Hamnet is already dead and he’s in the “not to be” room.

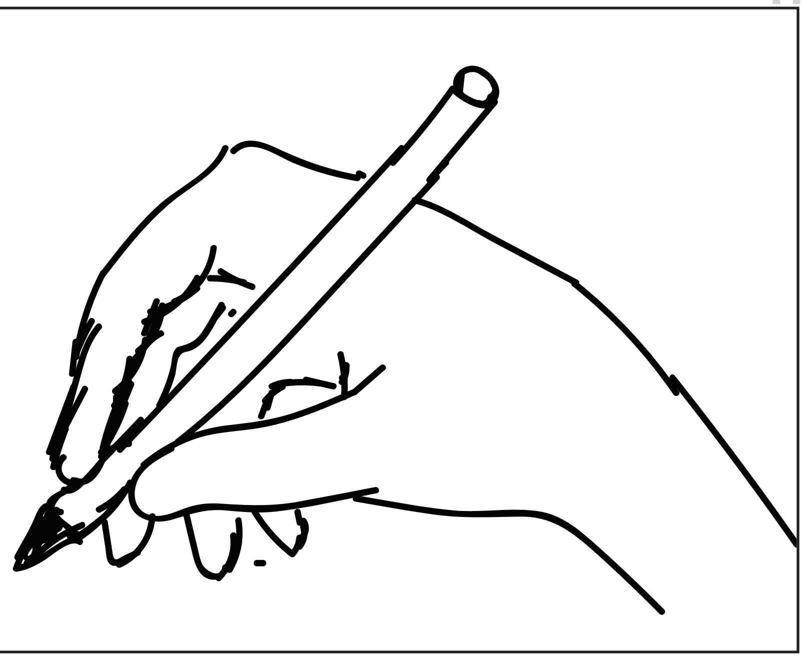
As for the question of what Hamnet actually meant to Shakespeare, the play skirts around this point, coming close, poking it with a stick, but never taking it head on. Hamnet asks his father how many people die in his plays: 74. “How many of those are children?” Hamnet consults his smartphone for this question, too — no signal. Shakespeare swings from angry to gentle, from morose to jolly, finally entreating Hamnet to stop haunting him. At the end of the play, Shakespeare quotes a moving passage from *King John* on the grief of losing a child.

In spite of such moments, the play holds back from the viewer the satisfaction of sinking one’s teeth into explicit connections and strident conjectures; rather, it paints in broader, metaphysical strokes. Cruder aspects of the play, including vulgar language, on-stage vomiting, and nudity, distract from the deeper meaning that the play aspires to. The performance packs a lot into 60 minutes, and while it leaves more questions than it answers, it is full of a passionate intensity that has the potential to “make thy two eyes, like stars, start from their spheres.”

GIANMARCO BRESADOLA

Ollie West plays Hamnet, Shakespeare’s mysterious son.

Are you handy with a pen?



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THEATER REVIEW

No offense, but get out

Riveting and contemporary, *Between Riverside and Crazy* premieres in New England

COURTESY OF NILE SCOTT STUDIOS

Octavia Chavez-Richmond, Stewart Evan Smith, Tyrees Allen, Lewis D. Wheeler, and Maureen Keiller appear in SpeakEasy Stage's production of *Between Riverside and Crazy.*

Between Riverside and Crazy

Written by Stephen Adly Guirgis

Directed by Tiffany Nichole Greene

Calderwood Pavilion at the Boston Center for the Arts

Sep. 14–Oct. 13

By Ethan Vo

ASSOCIATE ARTS EDITOR

Stephen Adly Guirgis's trademark coarse-grained dialogue returns in the New England premiere of *Between Riverside and Crazy*, an explosive comedy about an ex-cop bitterly fighting against eviction and injustice. Mounted by SpeakEasy Stage, which previously staged Guirgis's *The Motherfucker with the Hat*, the production is a thrilling and humorous depiction of urban life in New York with all of its challenges and contradictions.

Between Riverside and Crazy centers around Pops, played by Tyrees Allen, who lives in a rent stabilized apartment worth 10 times what he pays. Against the landord's will, Pops houses his son Junior (Stewart Evan Smith), Junior's girlfriend Lulu (Octavia Chavez-Richmond), and the ex-convict Oswaldo (Alejandro Simoes). The housing situation brings Pops into confrontations with his former NYPD partner, Detective O'Connor (Maureen Keiller), and her fiancée, Lieutenant Caro (Lewis D. Wheeler), as they battle over the settlement of the case which halted Pops's career. Rounding off the eclectic cast is the Church Lady (Celeste Oliva), who righteously condemns Pops's way of life in her own unique fashion.

The cast of this production is all-around excellent, especially in the case of Allen as Pops. Allen delivers a captivating performance that skillfully navigates both the fiery expletive-laden arguments as well as the tender confessions. Allen's performance as a father figure is so convincing that it even extends meta-theatrically — while Pops acts as the bedrock for the other characters, Allen provides a solid foundation for the other actors and the production as a whole. Wheeler's performance as Lieutenant Caro, one half of the self-proclaimed well intentioned yet ultimately malicious white couple, is also of special mention. While I found his friendly exchanges during the beginning a bit unnatural, his intensity in the later scenes is memorable and riveting. I was also rather impressed by the comedic timing of Chavez-Richmond and Oliva as they expertly mined for laughs despite the minor roles of their characters.

Design-wise, the most striking aspect of the production is the set's width, creating a panoramic view for audience members closer to the stage. Most of the action in the play focuses on one side of the stage, so you never have to turn rapidly back and forth between characters. There can be some shifting during scene transitions, however, so there is a tradeoff in seating between intimacy and field of view that one might want to take into consideration. Aside from that, the set design conveys the disorganized and decrepit qualities of Pops's apartment and how they reflect onto Pops's character. The incidental music choices were also effective in evoking mood, especially during the play's conclusion.

Underneath the raucous language and contemporary references, *Between Riverside and Crazy* richly explores themes of caretaking, adulthood, and the irrational complexities of human interaction. For example, Oswaldo's opening speech about almonds from Whole Foods and Ring Dings skillfully foreshadows the importance of abandonment and the father-son relationship while excavating the world in which the characters live. Deceptively layered and thought-provoking, the SpeakEasy Stage production of *Between Riverside and Crazy* deftly captures the vigorous pulse of contemporary New York City.

MOVIE REVIEW

The life of Gilda Radner

Love, Gilda traces the life of Gilda Radner, one of the seven original cast members of *Saturday Night Live*

★★★☆☆

Love, Gilda

Directed by Lisa D'Apolito

Starring Andrew Alexander, Anne Beats, Chevy Chase

Unrated

Now Playing

By Samantha D'Alonzo

Love, Gilda traces the life of the late Gilda Radner, an American comedian most famous for being one of the seven original cast members of Saturday Night Live. The film begins with insight into Radner's childhood in Detroit and ends with a poignant-documentation of Radner's fight with ovarian cancer, which ultimately led to her early death. The film heavily focuses on Radner's career, which began in high school and college theater and peaked in the 1970s as Radner shone on Saturday Night Live. The film truly captures her bubbly, captivating, and radiant personality. That being said, it treads very lightly on some of Radner's more serious issues, such as the untimely death of her father and her struggles with bulimia.

All of this — the positives and negatives of Radner's life — is presented through an artful collection of Radner's home videos, television appearances, excerpts from Radner's personal journal, and cameos by Radner's friends and current comedians inspired by Radner, such as Amy Poehler and Maya Rudolph.

As someone more familiar with the Colin Jost and Kate McKinnon era of Saturday Night Live, I appreciated these cameos. They provided strong insight on the impact of Radner's unfortunately short career. Being born decades after the peak of Radner's SNL prominence, my understanding of Gilda Radner's personality was heavily reliant on *Love, Gilda* and the home videos and excerpts chosen to represent her in the film. The film did a phenomenal job of highlighting her exuberant, endearing personality, and I was invested and engaged throughout.

That being said, the levity of the film was simultaneously refreshing and off-putting. Serious details of Radner's life, such as the death of her father when she was only 14, the difficulties of being a woman in a male-dominated field, and her struggle with bulimia later in life, were very much glossed over. There is a fine line between levity and severity, and *Love, Gilda* erred very much on the side of caution when dealing with it.

But what can you expect from a documentary about a woman who relied heavily on comedy to be in control of her life, especially during some of her darkest moments? What can you expect from the first comedian to make jokes about cancer on national television?

Delving deeper into Radner's personal problems and dwelling on negative emotions could have led to a more scandalous, heart wrenching version of the documentary, but it may have been as emblematic of Radner's life and legacy.

I naively hoped that Radner's charm and euphoria were authentic, and she was as joyful in life as she was presented in the film. I can't help but pessimistically wonder if comedy was simply a facade for Radner, and in reality she was deeply troubled and dissatisfied. I am realistically assuming that the truth is somewhere in the middle while acknowledging that the film leans heavily towards the former.

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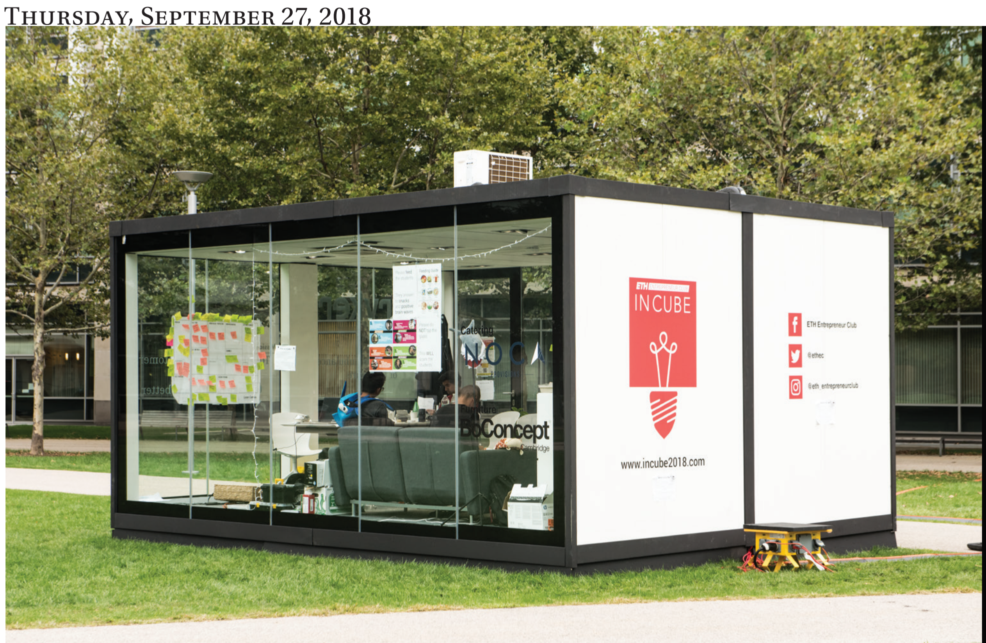
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Challenge
Imagining the am
of the future

INCUBE

From Sept. 21–24, a glass cube was installed at Stata North Court as part of a collaboration between the MIT Innovation Initiative and the ETH Zurich Entrepreneur Club. Jordan Harrod G, Eswar Anandapadmanaban G, Erica Yuen ’18, Samuel Solomon ’20, and Paolo Adajar ’21 were confined to the cube for 96 hours as they competed against other student cubes around the world to rethink the ambulance of the future. The students’ final presentation, held in Zurich, will place them in front of a live audience and jury.

stryker
Challenge
Imagining the ambulances
of the future

stryker
Imagining the ambulances
of the future

Please feed the students.
They answer to snacks and positive brain waves.
Feeding Guide
Please do NOT tap the glass.
This WILL scare the students.

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LAB SPOTLIGHT

Photovoltaics and solar power

MIT's approach to sustainable clean energy

COURTESY OF THE PHOTOVOLTAICS LAB

The Photovoltaics Lab is working to develop solar energy technologies.

By Quinn Brodsky

Tonio Buonassisi, the primary investigator at MIT's Photovoltaics Lab, recently took a trip to the Folgefonna National Park in Norway. There, he hiked across nearly 200 square kilometers of glaciers. Under the crunch of snow with each step he took, he could hear the water rushing below him — more water than was normal for the ebbs and flows of a glacier's natural lifetime — a constant reminder that his time to act was running out.

According to the United States Energy Information Administration, only 1.3 percent of the country's electricity comes from solar technology compared to the 63 percent generated by fossil fuels. At MIT, the Photovoltaics Lab (PVLab) focuses on materials and techniques to make solar energy more ubiquitous. Since its inception in 2007, the mission of the PVLab has been to develop solar energy technologies under three main canopies: commercial solar technology, which consists of studying impurities in silicon solar cells; next generation approaches, which include using artificial intelligence to analyze the impurities within the cell; and the study of photovoltaic (PV) systems.

To be viable, photovoltaic systems must be predictable, so that the system minimizes uncertainty around day-to-day fluctuations in the climate and optimizes the technology. As a result, the product is small, power-efficient, and cost-efficient. To be implemented on a wide scale, PV systems must also be persistent, providing a long-lasting solution to energy effiency issues. To these ends, the individual projects in PVLab range from making "artificial leaves" that mimic photosynthesis to combining machine learning, automation, and high-performance computing in order to predict the behavior of the systems.

Marius Peters, who leads the Systems on Silicon research group, dedicates much of his time to the predictability of PV systems. Recently, he completed a project with Amos Winter, the director of MIT's Global Engineering and Research (GEAR) Lab. Peters implemented solar cells that power desalination systems to produce potable water out of ground water in rural areas. These systems are comprised of two streams of water running through a membrane with a potential difference to strip the water of unwanted ions. By timing the process in a certain way, the team was able to reduce the number of batteries used as well as the number of panels that powered the system. One of the main roadblocks of the project was the cost. "Making [projects] cheap is really essential for getting them adopted in the areas where they really need it," Peters said. His team eventually reduced the cost of powering the system by 40 percent.

However, the work is not over — these systems must also be reliable and predictable. Much of Peters's work now focuses on the behavior of solar cells in different outdoor conditions. Although silicon is the most widely used material to make solar cells, Peters and his group have studied cadmium telluride as an alternative. Cadmium telluride is less sensitive to changes in temperature and humidity, thus resulting in a more stable production of energy over time compared to silicon.

Recent innovations like these instill hope into Peters. In his eyes, renewable energy is at its renaissance. "Even within the United States, even under the current administration, and even under certain arguments put up against renewables, solar and wind installations in 2018 have counted for the vast majority of new installed electricity sources," he noted. He encouraged students to face the challenges that renewable energy poses, both technical and political, in order to make sustainable energy cheaper and more reliable. "It's not just an idea," Buonassisi said, speaking to the importance of sustainable energy. "It's something very real."

The potential obstacles to sustainable energy may not be as concrete as the technology required to implement it. In particular, Buonassisi feels there are habits accepted in academia that can hamper productivity. "There are a number of unhealthy, culturally accepted things in academia and inefficient R&D is one of them. We're trying to solve climate change issues, we don't have time!" Buonassisi worried. "There are many unhealthy habits in academia, from working long hours — but a lot of that is procrastination and waste — to accepting all of the horrific things that happened before the #MeToo movement dragged it all out of the closet."

For Buonassisi, the solution is a healthy dose of self-reflection. "It's very easy to point a microscope away from us toward a material and [analyze] it, but focusing the microscope back on ourselves and asking 'How are we conducting research? Can it be done faster?'" he wondered. "It's almost like a trigger for many academics." According to Buonassisi, there is an accepted form of mimicry in many areas of academia — newcomers to research learn that to get published, they must follow certain norms. As a result, they model their own work around methods of research that have already been established. "We don't challenge the way we do R&D," Buonassisi said.

Peters sees the state of research in a hopeful light. He emphasizes that scientists need to collaborate to find sufficient solutions to complex problems. "The role that we have as researchers in this field has increased. There is currently one of the biggest transitions in the energy infrastructure on the planet on its way."

"It's going to go a lot further, and it needs researchers — it needs people to be educated and trained for this," he added.

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SIEBEL SCHOLARS

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Midterm Panic

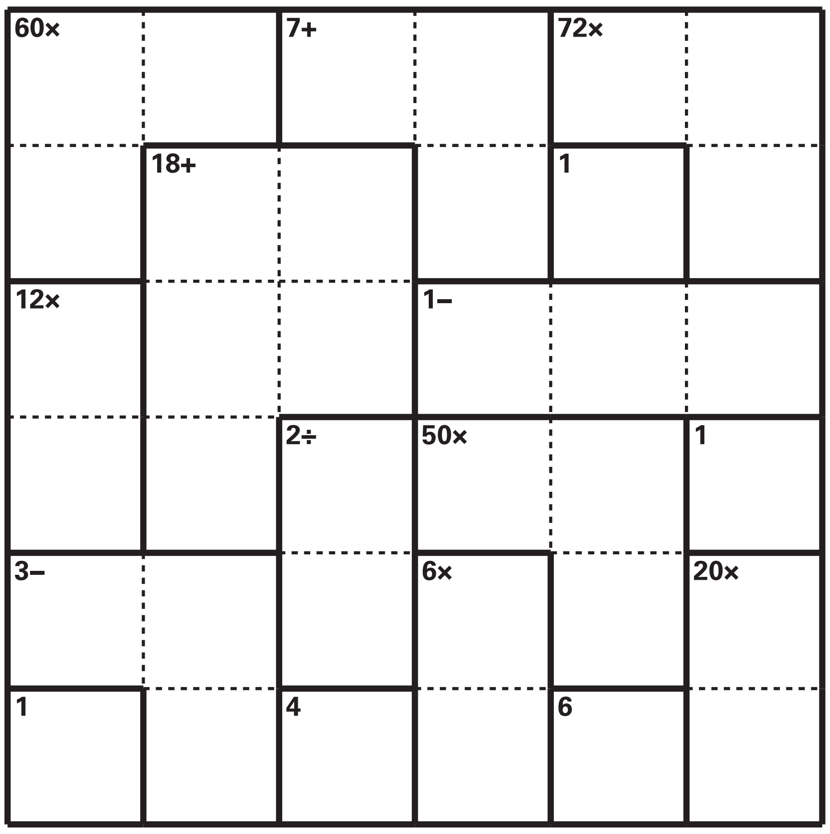
Solution, page 16

2	6		4		1	9		7
				3				
			7	2		5	8	
4		9						6
		6				8		
1						2		9
	7	4		8	2			
				6				
9		2	3		5		6	8

Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.

3.091? 3.09Fun!

Solution, page 16



60×		7+		72×	
	18+			1	
12×			1–		
		2÷	50×		1
3–			6×		20×
1		4		6	

Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–6. Follow the mathematical operations for each box.

Nothing's Wrong

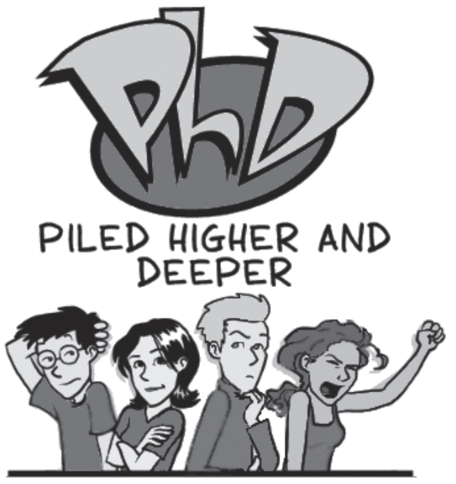
by Billie Truitt

Solution, page 16

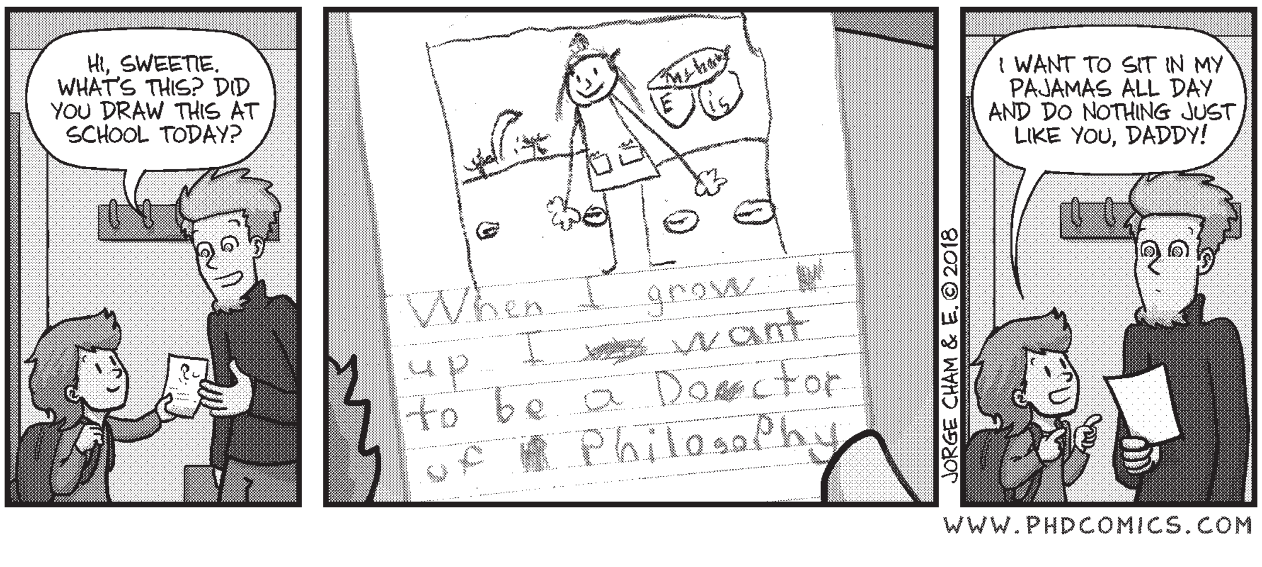
1	2	3	4	■	5	6	7	8	■	9	10	11	12	13
14				■	15				■	16				
17				■	18				■	19				
20				21					22		■	23		
■	■	■	24				■	■	25		26			
27	28	29				■	30	31				■	■	■
32			■	■	33	34			■	35		36	37	38
39			40	41					42					
43					■	44				■	■	45		
■	■	■	46		47			■	48	49	50			
51	52	53				■	■	54				■	■	■
55			■	56		57	58					59	60	61
62			63		■	64				■	65			
66					■	67				■	68			
69					■	70				■	71			

ACROSS
1 Chest muscles, for short
5 Barbie or Ken
9 Moral code
14 Tear down
15 "It's my turn"
16 Instruct
17 Racetrack shape
18 Join a choir, say
19 Boat that's paddled
20 Pitcher's dream outing
23 __-in-a-million (rare)
24 Part of the eye
25 In danger
27 Snoozing
30 Blender setting for baby food
32 Cow's comment
33 Jungle king
35 Pay increase
39 Gem without defects
43 Radio, TV, etc.
44 Gas in lighted signs
45 "You're it!" game
46 Boxer's weapons
48 A scratch or a dent
51 Pretentious
54 Generic dog name
55 Pub beverage
56 Match made in heaven
62 Poker player's "pass"
64 Operatic solo
65 Cabbage salad
66 Durable trousers material
67 Tenant's payment
68 "For Pete's __!"
69 All finished, as a meal
70 Person known for wisdom
71 What visors shade

DOWN
1 Stage accessory
2 Roof overhang
3 Industrial mogul
4 Photo of the photographer
5 Faithful follower
6 Leaves out
7 Respiratory organ
8 Women's links org.
9 And so on
10 Coffee alternative
11 Capital of Vietnam
12 Computer screen images
13 Place for rouge
21 Before, in poems
22 Scratch or dent
26 Package of paper
27 Two-band, as a radio
28 "Filet" fish
29 Batch of laundry
30 Sits for a portrait
31 Loosen, as a knot
34 "Small world, __ it?"
36 Slightest bit
37 Slight obstacle
38 Just barely beat
40 Internet hotspot connection
41 Flattered to excess
42 Direct attention to
47 Feeling blue
49 "Without further __ . . ."
50 Hair salon goo
51 Jousting weapon
52 "Hi," in Hawaii
53 "Credit or __?"
54 Throw with force
57 Servings of corn
58 Vicinity
59 Theater production
60 Erie or Huron
61 Lambs' mothers
63 Opposite of WSW

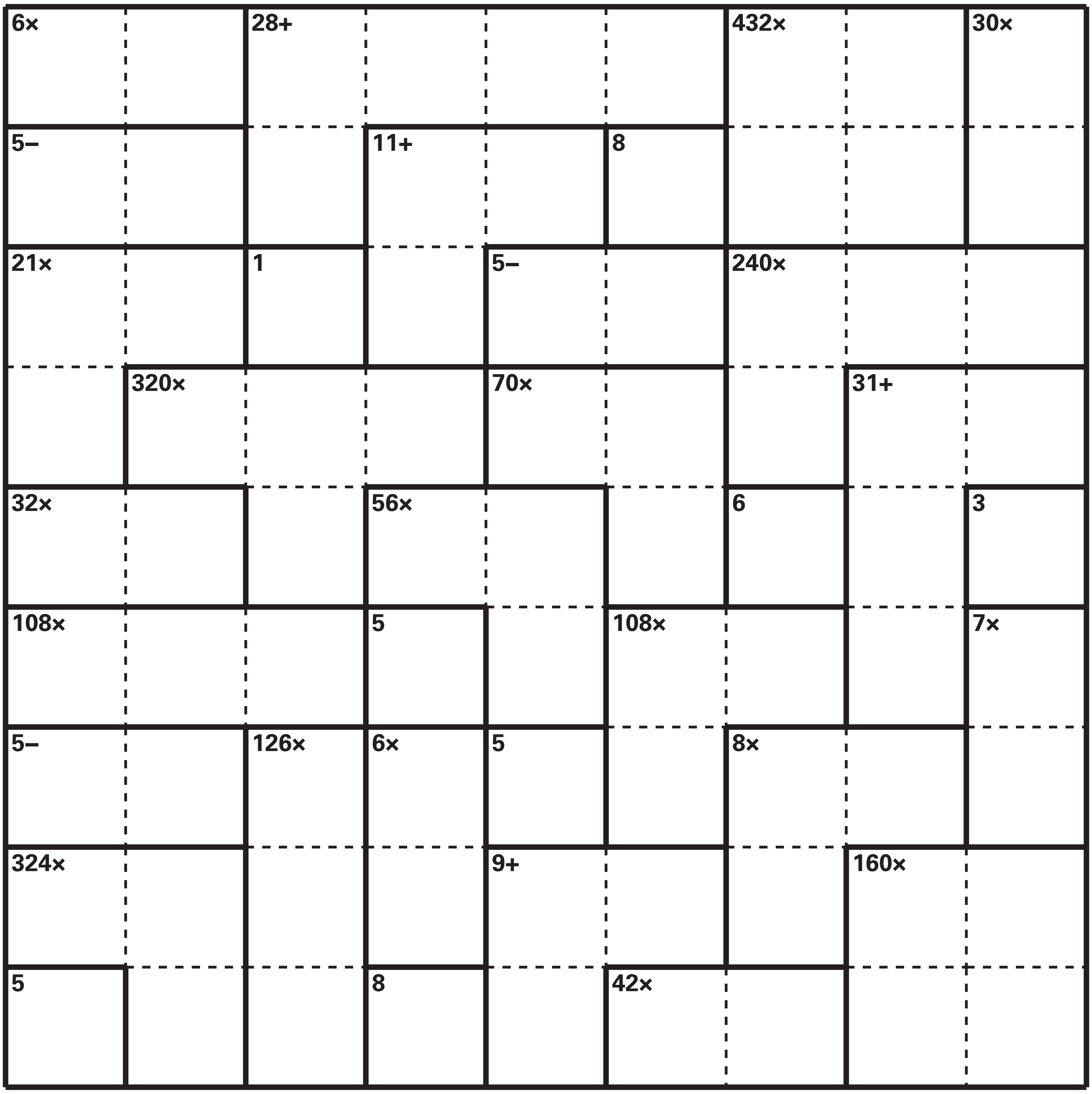


by Jorge Cham


HI, SWEETIE. WHAT'S THIS? DID YOU DRAW THIS AT SCHOOL TODAY?
When I grow up I want to be a Doctor of Philosophy
I WANT TO SIT IN MY PAJAMAS ALL DAY AND DO NOTHING JUST LIKE YOU, DADDY!
JORGE CHAM & E. ©2018
WWW.PHDCOMICS.COM

It's Raining, It's Pouring

Solution, page 16



6×		28+				432×		30×
5–			11+		8			
21×		1		5–		240×		
	320×			70×			31+	
32×			56×			6		3
108×			5		108×			7×
5–		126×	6×	5		8×		
324×				9+			160×	
5			8		42×			

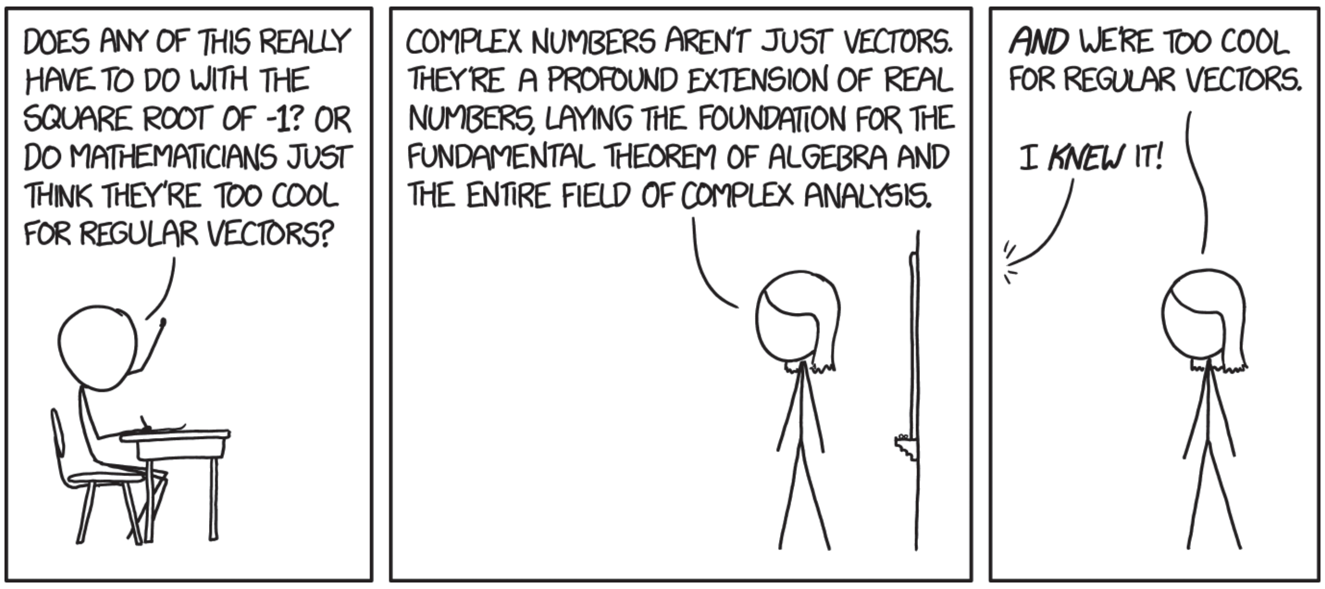
Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–9. Follow the mathematical operations for each box.

xkcd

A webcomic of romance, sarcasm, math, and language

by Randall Munroe

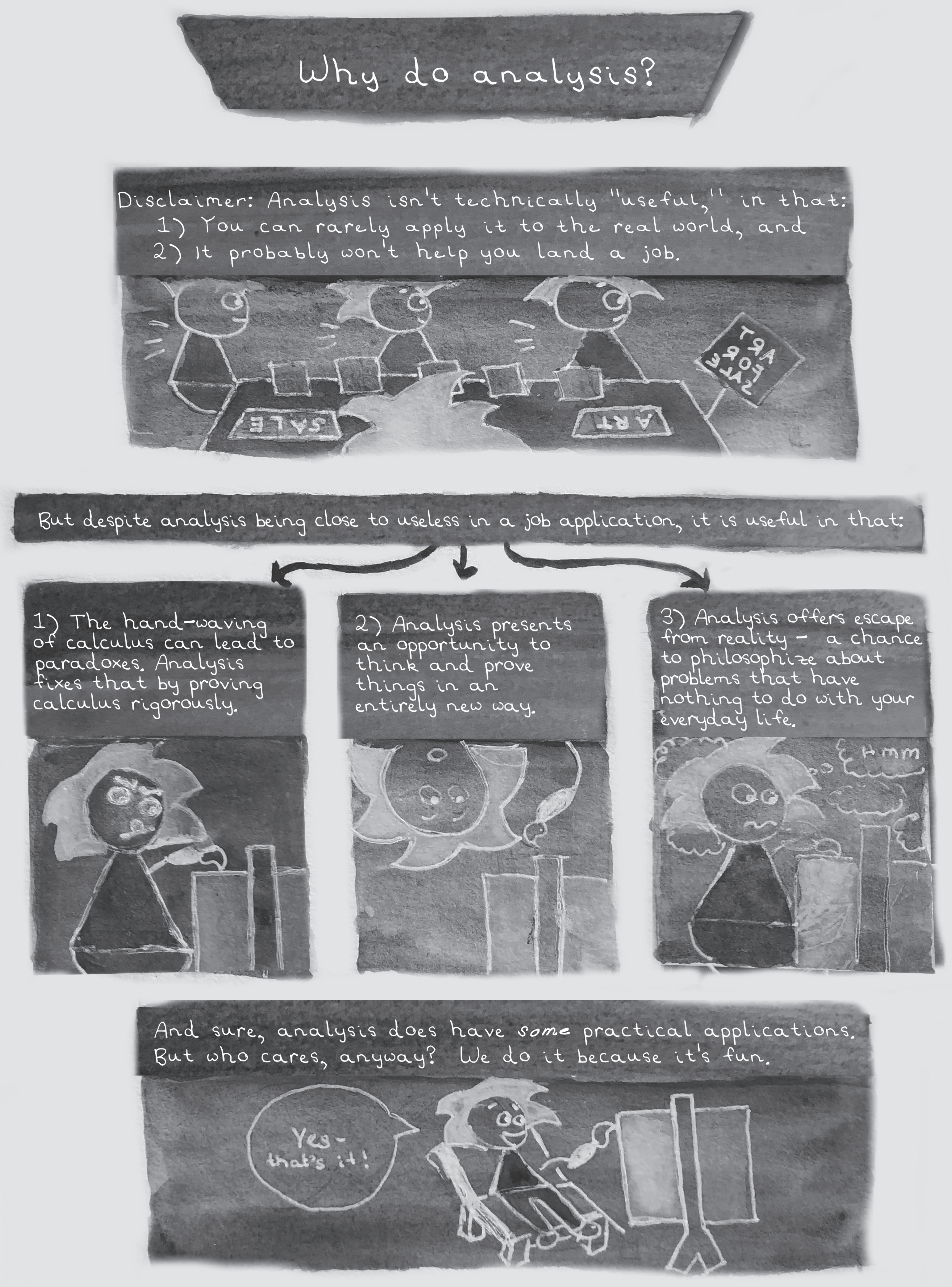
[2028] Complex Numbers


DOES ANY OF THIS REALLY HAVE TO DO WITH THE SQUARE ROOT OF -1? OR DO MATHEMATICIANS JUST THINK THEY'RE TOO COOL FOR REGULAR VECTORS?
COMPLEX NUMBERS AREN'T JUST VECTORS. THEY'RE A PROFOUND EXTENSION OF REAL NUMBERS, LAYING THE FOUNDATION FOR THE FUNDAMENTAL THEOREM OF ALGEBRA AND THE ENTIRE FIELD OF COMPLEX ANALYSIS.
AND WE'RE TOO COOL FOR REGULAR VECTORS.
I KNEW IT!

I'm trying to prove that mathematics forms a meta-abelian group, which would finally confirm my suspicions that algebraic geometry and geometric algebra are the same thing.

Introduction to Real Analysis

by Anshula Gandhi


Why do analysis?
Disclaimer: Analysis isn't technically "useful," in that:
1) You can rarely apply it to the real world, and
2) It probably won't help you land a job.
ART FOR SALE
SALE
ART
But despite analysis being close to useless in a job application, it is useful in that:
1) The hand-waving of calculus can lead to paradoxes. Analysis fixes that by proving calculus rigorously.
2) Analysis presents an opportunity to think and prove things in an entirely new way.
3) Analysis offers escape from reality - a chance to philosophize about problems that have nothing to do with your everyday life.
Hmm
And sure, analysis does have *some* practical applications. But who cares, anyway? We do it because it's fun.
Yes - that's it!

See more at anshula.com/realanalysis

Ps
Id
EXPO
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NOTES
>_

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SOCCER

Hat tricks!

MIT Women's Soccer begins another record-breaking season

By Deanna Delgado

The MIT Women's Varsity Soccer team faced a challenging start to their season, with an at-home tie and a loss on the road in two double-overtime games. These initial results were enough to continue the undefeated-at-home-streak MIT has held since the 2015 season. But the team is hungry for more as they set out to defend their NEWMAC conference championship and national ranking.

The team "came into the season really excited to get back out on the field again," Captain Shannon Miller '19 said in an interview with *The Tech*.

"We added a super strong freshman class and I felt like everything was coming together well going into our first two games. Admittedly, those games didn't end with the outcomes we wanted, but there was still a lot of good stuff happening that we were excited to build on."

Since its initial shortcomings, MIT has settled into its groove and won seven consecutive games, beginning with a stunning victory against Worcester State. In this Sept. 4 game, the first three goals were scored by rookie Karenna Groff '22 in 51 seconds, coming in as the second-fastest hat trick in NCAA Division III Women's Soccer history. Following this mark were goals by Allie Werner '20, Lily Bailey '20, Anna Weinstein '22, and Sarah DiIorio '19, to give the Engineers a final score of 7–0.

One week and two wins later, MIT went up against Roger Williams University. MIT came out strong, as Roger Williams has proven to be a tricky foe in the past. Captain Amy Apostol '19 jumped on their back line fast and, following the pattern set by Groff, scored the first three goals of the game. Apostol's hat trick clocked in at one minute and 50 seconds, the seventh fastest hat trick in NCAA Division III Women's Soccer history, putting Apostol alongside Groff in the record books.

Not yet satisfied with their lead, MIT continued to play strong to put the final nail in the coffin. Montana Reilly '20 scored the next two goals, and Kiara Wahnschafft '21 and Brittany Sacks '21 delivered the last pair, finishing the game with another 7–0 win for the Engineers.

Apostol discussed the Engineers' winning streak: "momentum is very important for us to have moving into conference play the next couple of weeks." According to Apostol, "every game [MIT plays] in the conference is extremely important because these games ultimately lead to a conference championship and thus a good seed in the NCAA Tournament."

Both Apostol and Miller pointed to the 11-member freshman class as a vital part of the team's current and future success. Apostol noted that the team has "added so much talent this year with the freshman class. Each of them brings something different to the team and allows [MIT] to be even more dynamic than before."

Prompted by the team's success thus far, head coach Martin Desmarais is looking forward to the future challenges. "We are clicking in attack, scoring goals, and also have been very strong defensively, which doesn't give teams many chances to win against us. But we have some big games coming up, so we are working on getting sharper and continuing to improve," Desmarais said.

You heard it from the coach himself: the team has big games coming up, so make sure to stop by Roberts Field at Steinbrenner Stadium if you want to support them. The next home games are against the Cougars of Clark University on Friday, Sept. 28, and against the Wellesley College Blue on Tuesday, Oct. 9.

Want to see these teams battle it out in person?

Join *The Tech*!

sports@tech.mit.edu

ASSEL ISMOLDAYEVA – THE TECH

Meredith Pepin, associate director of career counseling and education, welcomed first year students at the Career Fair Tips for First Year Undergraduates Panel held Sept. 19.

October 1, 2018
2:00pm
MIT
E25-111

Advancing Wellbeing speaker series

Barbara Fredrickson

Kenan Distinguished Professor, Dept. of Psychology and Neuroscience, University of North Carolina at Chapel Hill

Positivity Resonates: Effects of face-to-face social connection on human well-being

Solution to Midterm

from page 12

2	6	8	4	5	1	9	3	7
5	4	7	8	3	9	6	2	1
3	9	1	7	2	6	5	8	4
4	2	9	5	1	8	3	7	6
7	3	6	2	9	4	8	1	5
1	8	5	6	7	3	2	4	9
6	7	4	9	8	2	1	5	3
8	5	3	1	6	7	4	9	2
9	1	2	3	4	5	7	6	8

Solution to Nothing

from page 12

P	E	C	S	■	D	O	L	L	■	E	T	H	I	C
R	A	Z	E	■	I	M	U	P	■	T	E	A	C	H
O	V	A	L	■	S	I	N	G	■	C	A	N	O	E
P	E	R	F	E	C	T	G	A	M	E	■	O	N	E
■	■	■	I	R	I	S	■	■	A	T	R	I	S	K
A	S	L	E	E	P	■	P	U	R	E	E	■	■	■
M	O	O	■	■	L	I	O	N	■	R	A	I	S	E
F	L	A	W	L	E	S	S	D	I	A	M	O	N	D
M	E	D	I	A	■	N	E	O	N	■	■	T	A	G
■	■	■	F	I	S	T	S	■	D	A	M	A	G	E
L	A	D	I	D	A	■	■	F	I	D	O	■	■	■
A	L	E	■	I	D	E	A	L	C	O	U	P	L	E
N	O	B	E	T	■	A	R	I	A	■	S	L	A	W
C	H	I	N	O	■	R	E	N	T	■	S	A	K	E
E	A	T	E	N	■	S	A	G	E	■	E	Y	E	S

Solution to 3.091?

from page 12

5	6	2	1	4	3
2	3	5	4	1	6
4	5	1	6	3	2
3	4	6	5	2	1
6	1	3	2	5	4
1	2	4	3	6	5

Solution to Raining

from page 13

6	1	4	9	3	7	8	2	5
7	2	5	1	4	8	9	3	6
3	7	1	6	9	4	5	8	2
1	5	8	4	7	2	3	6	9
4	8	2	7	1	5	6	9	3
2	6	9	5	8	3	4	7	1
8	3	6	2	5	9	1	4	7
9	4	7	3	6	1	2	5	8
5	9	3	8	2	6	7	1	4

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